

5. BIRD BONES FROM ATTU ISLAND

Diomedea albatrus Pallas. Short-tailed Albatross. Three skulls, 1 pair of maxillae, 2 synsacra, 3 tarsometatarsi, 2 metacarpals, 7 femurs.

Puffinus griseus (Gmelin). Sooty Shearwater. Five humeri.

Puffinus sp. Shearwater. Six humeri, probably *P. tenuirostris*.

Fulmarus glacialis rodgersi Cassin. Pacific Fulmar. One humerus.

Phalacrocorax pelagicus Pallas. Pelagic Cormorant. Four sterna, 3 synsacra, 4 skulls, 3 coracoids, 11 ulnae, 31 humeri, 1 tarsometatarsus, 26 femurs, and 16 tibiotarsi.

Branta nigricans (Lawrence). Black Brant. Four humeri.

Philacte canagica (Sevastianoff). Emperor Goose. One femur, 14 humeri.

Anser albifrons (Scopoli). White-fronted Goose. Two tarsometatarsi.

Somateria v-nigra Gray. Pacific Eider. One sternum, 4 skulls, 1 coracoid, 4 humeri.

Melanitta deglandi (Bonaparte.) White-winged Scoter. One humerus.

Larus hyperboreus Gunnerus. Glaucous Gull. Two skulls.

Larus glaucescens Naumann. Glaucous-winged Gull. Eleven humeri, 17 ulnae, 2 metacarpals.

Larus argentatus smithsonianus Coues. Herring Gull. Three humeri.

Larus canus brachyrhynchus Richardson. Short-billed Gull. Two humeri.

Uria sp. Murres. Four humeri, 1 skull.

Cephus columba Pallas. Pigeon Guillemot. Two humeri.

Corvus corax principalis Ridgway. Northern Raven. Two humeri, 1 tarsometatarsus, 2 ulnae, 1 skull.

ENTOMOLOGY.—*The genus Lysiognatha Ashmead.*¹ R. A. CUSHMAN, Bureau of Entomology and Plant Quarantine. (Communicated by C. F. W. MUESEBECK.)

Many "rare" insects are rare only until something of their seasonal and environmental habits is discovered. Until the spring of 1933 *Lysiognatha* was a "rare" insect. In 1895² Ashmead described the genus and its type species, *comstockii*, from three specimens collected near Ithaca, N.Y., in 1872 by H. H. Smith. No other specimens had been recorded, and so far as I know only one other, a specimen without abdomen taken in Colorado by C. F. Baker and for many years reposing among unclassified material in the National Museum, had been collected.

¹ Received July 20, 1937.

² Proc. Ent. Soc. Wash. 3: 276. 1895.

REDISCOVERY OF LYSIOGNATHA

In 1933 J. C. Bridwell became interested in the sawflies of the genus *Xyela*, and observed them ovipositing in the young staminate cones of the Virginia pine (*Pinus virginiana*) at Clifton, Va. He also collected some of the parasitic Hymenoptera that he found frequenting the pine trees. These he submitted to me for identification. Among them I was surprised to find four female specimens representing two species of *Lysiognatha*, collected about May 1, 1933.

SEASONAL HISTORY AND BIOLOGY

On April 28 and 29, 1934, Mr. Bridwell and I visited groves of young pine trees in Virginia a few miles from Washington, D. C., and found *Lysiognatha* very abundant. At this time a large majority of the specimens were males. A week later specimens were much less numerous and all were females. This indicates that the males emerge before the females, and also that April 28 was not far from the earliest emergence date for *Lysiognatha*. During this period the larvae of *Xyela* were reaching full growth, and about May 5 were leaving the cones in large numbers. Examination of the nearly 200 specimens of *Lysiognatha* collected disclosed the same two species taken in 1933 by Mr. Bridwell and also many specimens of a third species.

While examining larvae of *Xyela* for evidence of parasitization we found many bearing on or near their heads peculiar eggs, which we were able, by comparing them with ovarian eggs, to identify as those of *Lysiognatha*. The egg of *Lysiognatha* is comparatively large, white, elongate oval, slightly curved, and slightly larger at the cephalic end. It is attached to the host by a short pedicel thrust through the skin of the host. Imbedded in the foot of the stalk is a black heavily sclerotized body that apparently serves as an anchor. Fig. 1,*b*, shows an egg dissected from the ovary of *Lysiognatha* and Fig. 1,*c*, three eggs attached to a *Xyela* larva.³ The position of the egg on the host suggests the surmise that the peculiar mandibles of *Lysiognatha* may be employed for holding the host during oviposition.

It is very evident that hatching never takes place until after the host has entered the soil for pupation, for of the many eggs that we observed on *Xyela* larvae just after their emergence from the cones, none had hatched. In fact, it was not until July 3, more than two months after the discovery of the egg, that a newly hatched larva was observed. In hatching the larval *Lysiognatha* does not entirely

³ Preliminary notice of the rediscovery of *Lysiognatha* and of the identity of its egg was published in Proc. Ent. Soc. Wash. 36: 262. 1934.

emerge from the eggshell, but uses it as an anchor for holding to its host.

On August 6 the first full-grown larva was found. It is a typical ichneumonid larva of the externally parasitic type, as shown by the figure of the head, Fig. 1,*d*. Subsequently many larvae were found in their thin, shining, transparent cocoons within the cocoons of *Xyela*.

The first pupa was found on September 20 and by September 26 most of the larvae had pupated. Although *Xyela* cocoons were collected and examined as late as December 17, *Lysiognatha* had not advanced beyond the pupal stage, and it is evident that it hibernates in that stage.

TAXONOMY

Position in classification.—At the time of the original description of *Lysiognatha*, Ashmead created for it the subfamily Lysiognathinae, which he placed as the first subfamily of the Ichneumonidae. In 1900, however, in his *Classification of the ichneumon flies*, he treated it as a subfamily of the Alysiidae because of the position and form of the mandibles. The Spanish hymenopterist, G. Ceballos, examined the types of *L. comstockii* at the National Museum in 1928, and subsequently⁴ expressed the opinion that it is ichneumonid.

In my opinion the cephalic and mandibular characters are adaptive, whereas the venation and the free second abdominal suture, together with the characters of the larva, are phylogenetic characters and hence of much more significance in determining the affinities of the group. In venation and abdominal structure there is no essential difference between *Lysiognatha* and many ichneumonid, especially ichneumonine, genera, and it is to the Ichneumonidae that I think it should be relegated.

The association of *Lysiognatha* with the primitive *Xyela* would seem to indicate a primitive position for it within the Ichneumonidae. On the other hand, the form of the head and of the mandibles and the method of reproduction indicate a much more recent origin than that of many other Ichneumonidae. Whatever the placing, the form of the head and of the mandibles would render the group anomalous. In the more conservative characters of venation, form of abdomen, and form of ovipositor it is perhaps most like the Ichneumonini, while its method of reproduction allies it with the Tryphonini. In my opinion the proper placing of the group is low on the phylogenetic line between the Ichneumonini and the Tryphonini. The anomalous form of the head and that of the mandibles are sufficient to warrant the recognition of the Lysiognathinae as a distinct subfamily.

⁴ Mem. Real Soc. Esp. Hist. Nat. 25: 20. 1929.

Subfamily and generic characters.—Head in front view (Fig. 1,*a*) broader than long, with mouth very broad, mandibles articulating below eyes, the articulating membrane extending upward behind eyes; malar space obliterated; mandible nearly twice as long as broad at base, nearly parallel sided, with two large, slightly out-turned teeth, from each of which a prominent carina runs back along margin toward base so that outer face of mandible toward apex is concave; clypeus correspondingly broad, extending from eye to eye, ten or more times as broad as long medially, where it is

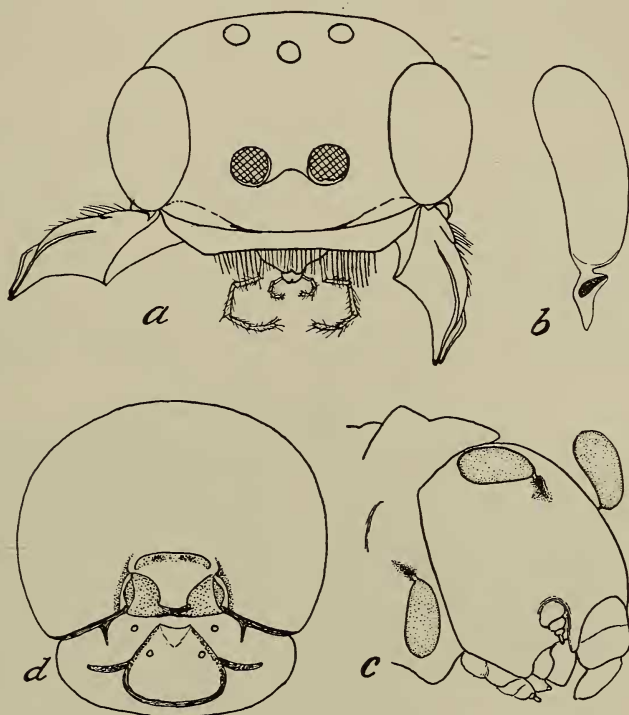


Fig. 1.—*a*, head of *Lysiognatha longicauda* Cushman; *b*, ovarian egg of *Lysiognatha* sp.; *c*, eggs of *Lysiognatha* sp. in situ on larva of *Xyela* sp.; *d*, head of larva of *Lysiognatha* sp.

shortest; maxillary palpus 5-jointed; labial palpus 4-jointed (erroneously given as 3-jointed by Ashmead); head behind eyes buccate, temple nearly or quite reaching outside tangent of eye, occiput deeply concave and margined by a distinct carina; antennae short, slender, filiform, about 22–25-jointed, scape semiglobose, squarely truncate at apex, first joint of flagellum shorter than second and slightly thickened toward base.

Thorax stout, shining, weakly sculptured; epomia lacking; notauli shallow; sternaui lacking; prepectus defined; mesolcus deep, not closed posteriorly; propodeum incompletely areolated, median carinae diverging from base to apex, basal area small quadrangular, areola and petiolar area confluent; lateral carinae present or absent; spiracle very small, circular, situated somewhat before middle.

Legs stout, rather long; calcaria 1:2:2, short, inner calcaria on middle and hind legs not much longer than outer; claws small, simple.

Wings broad; stigma broadly triangular; areolet deltoid, oblique, sessile or petiolate; second recurrent with separated bullae; second discoidal cell broad at base; abscissula shorter than intercubitella; nervellus broken below middle.

Abdomen in female short and broad, sessile, little longer than thorax; first tergite large, slightly longer than broad, sides divergent, dorsal carinae extending well onto disk, spiracle basad of middle; other tergites strongly transverse, apical ones weakly sclerotized; ovipositor long, subsagittate but not serrate at apex; hypopygium rather prominent; venter entirely membranous. Abdomen in male more slender than in female, broadest near apex; first tergite much longer than broad; second nearly as long as broad; apical tergites more strongly sclerotized than in female.

KEY TO SPECIES

1. Vertex with a deep median, longitudinal sulcus extending back onto occiput and interrupting the occipital carina.....2
Vertex with at most a faint sulcus; occipital carina not interrupted....3
2. Female largely ferruginous.....*comstockii* Ashmead
Female largely blackish.....*sulcata*, n.sp.
3. Occipital carina sharply curved or angulate medially; ovipositor sheath nearly as long as body.....*longicauda*, n. sp.
Occipital carina evenly and broadly curved medially; ovipositor sheath much shorter than body.....*bridwelli*, n. sp.

Lysiognatha comstockii Ashmead

Lysiognatha comstockii Ashmead, Proc. Ent. Soc. Wash. 3: 276. 1895.

Known only from the three specimens of the type-series. The two females are in the U. S. National Museum, the holotype without wings and antennae and the paratype without abdomen.

This is the palest of the four species, at least in the female, being of a ferruginous color with abdomen almost stramineous. It also differs from the next following species, to which it is most closely related by the possession of the vertical sulcus, in having the thorax polished and virtually without sculpture and the tergites beyond the second evenly sclerotized throughout.

Lysiognatha sulcata, n. sp.

Closely related to *comstockii* and possibly not distinct, but judging from the meager material in both species it differs constantly in the female in the blackish head and thorax and the more distinctly sculptured and less polished thorax, and in having the tergites beyond the first so weakly sclerotized along the apical and lateral margins that in dried specimens they are much distorted. The last may be due to a teneral condition, but the fully developed color argues against this possibility. Furthermore, the difference of nearly two months in the collecting dates could hardly be accounted for by the difference in latitude.

Female.—Length 3.25 mm; antenna 2.75 mm; ovipositor sheath 1.75 mm.

Head polished, virtually without sculpture; a deep sulcus extending from between the ocelli nearly to the occipital foramen and interrupting the occipital carina.

Thorax subpolished, subtly alutaceous; mesoscutum weakly and sparsely punctate; propodeum more strongly alutaceous, the carinae faint; areolet sessile.